PÉCSI TUDOMÁNYEGYETEM
ÁLTALÁNOS ORVOSTUDOMÁNYI KAR

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Smart technologies - 3D technologies

Judit E Pongracz, Department of Pharmaceutical Biotechnology; School of Pharm

The 3D Project of the University of Pecs

- 3D Project – GINOP 2.3.2
- Leader: Prof. Dr. Miklós Nyitrai
- Grant: **1.86 Billion HUF** – *„3D Visualization and Innovative Printing and Service Centre"*

Main project elements

- IT and engineering centre (20M);
- Teaching centre (30M);
- Printers and accessories (600M);
- Bioprinting (100M);
- Softvares

The main goal of the project

- World class equipment;
- Outstanding professionals;
- Education centre;
- Research centre;
- Services/cooperation

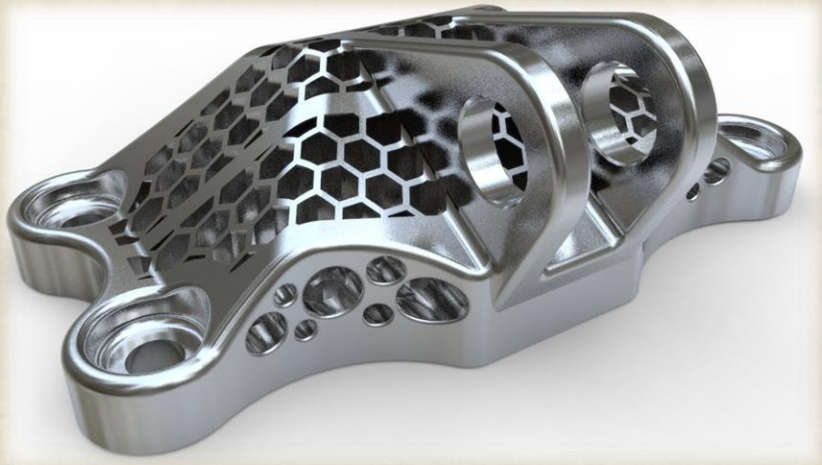
Workforce

- Existing professionals at the University;
- Increase the work force with 2 or 3 professionals/subproject;
- Building on further education, courses, connections

3D printing technologies

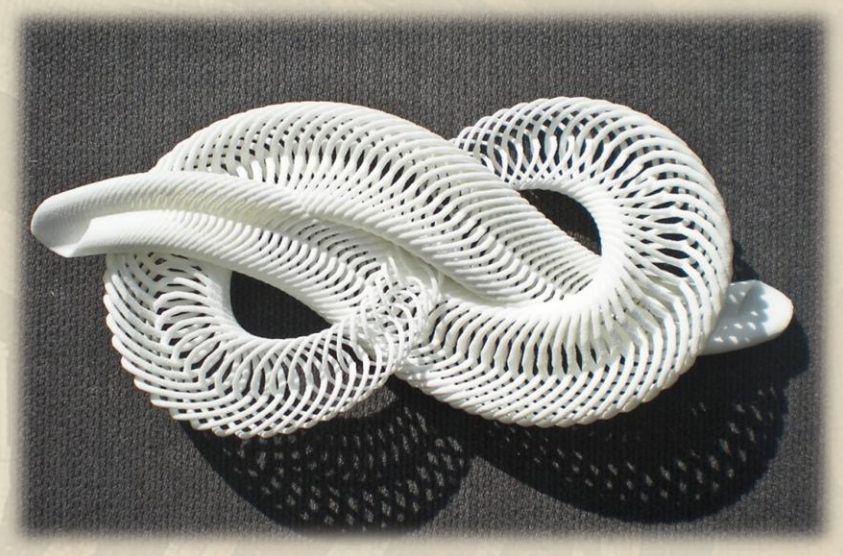
- Complex structures created layer by layer using various different materials (metals, polymers, ceramics, etc.), diverse printing processes (FDM, SLS, DMSL stb.)
- Additive production technologies
- Complicated structures, individual solutions
- Fast
- Cost effective (rapid prototype, small

SLA/DLP Technology



DMSL Technology

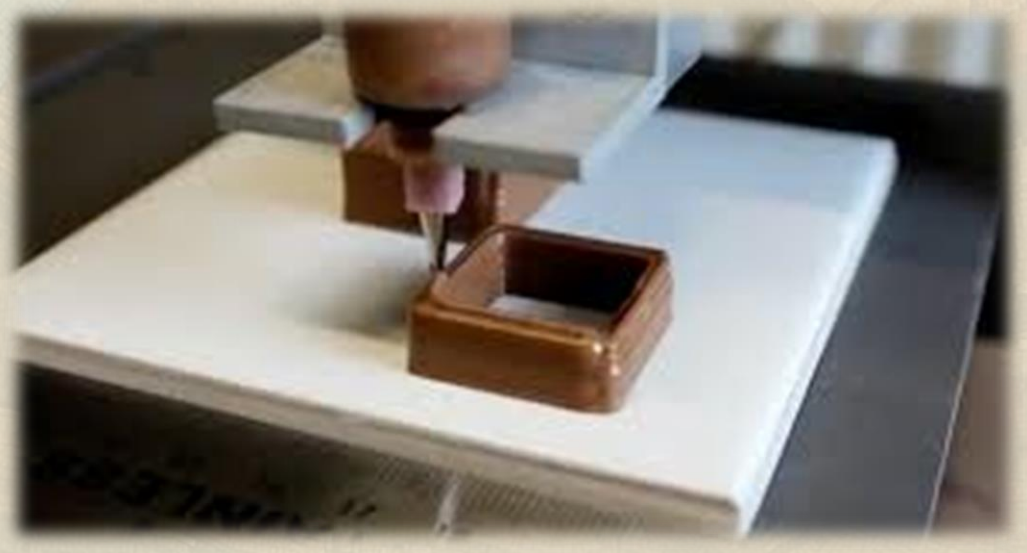
FDM/FFF Technology

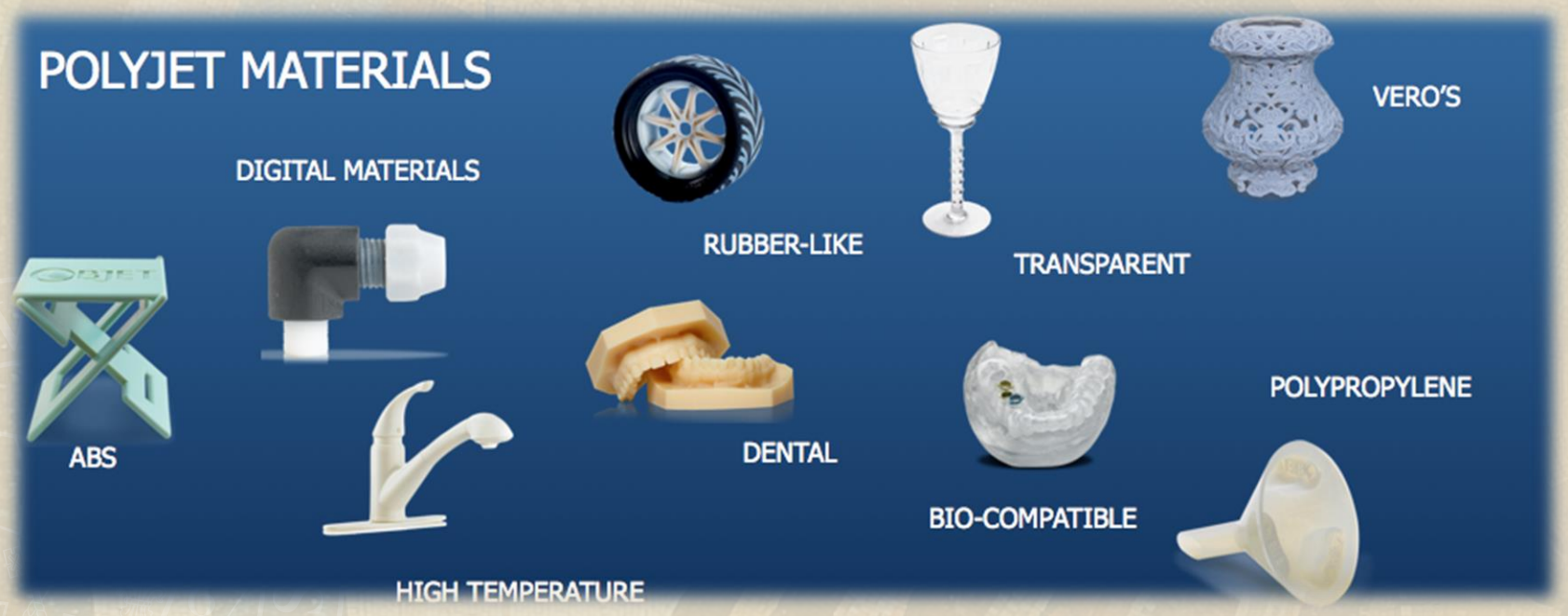


SLS Technology

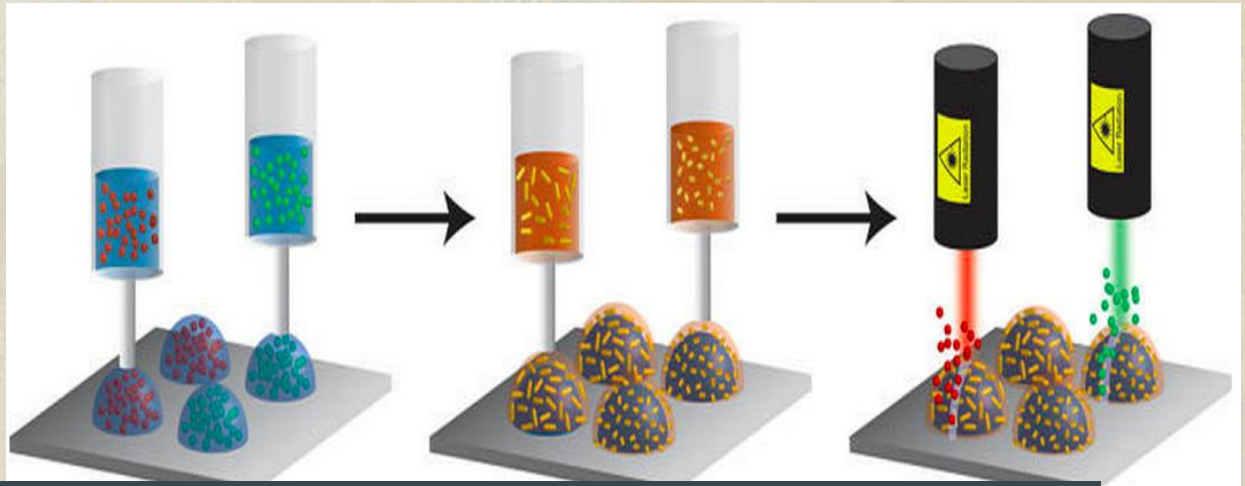
„Extra” materials – everyday objects

- Clothes
- Food printing
- Concrete printing
- Ceramics printing



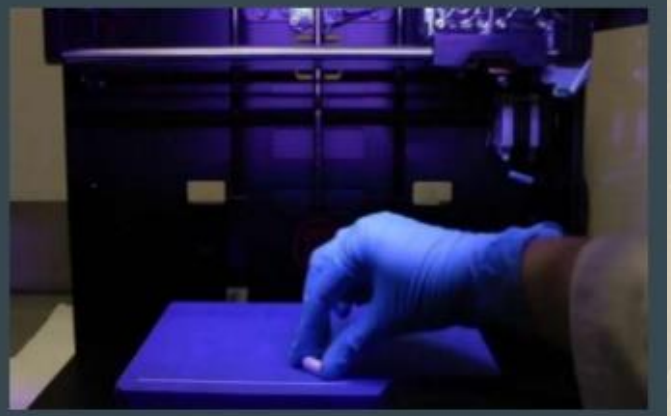

POLYJET MATERIALS
DIGITAL MATERIALS
RUBBER-LIKE
TRANSPARENT
VERO'S
ABS
DENTAL
POLYPROPYLENE
BIO-COMPATIBLE
HIGH TEMPERATURE

Printed medications



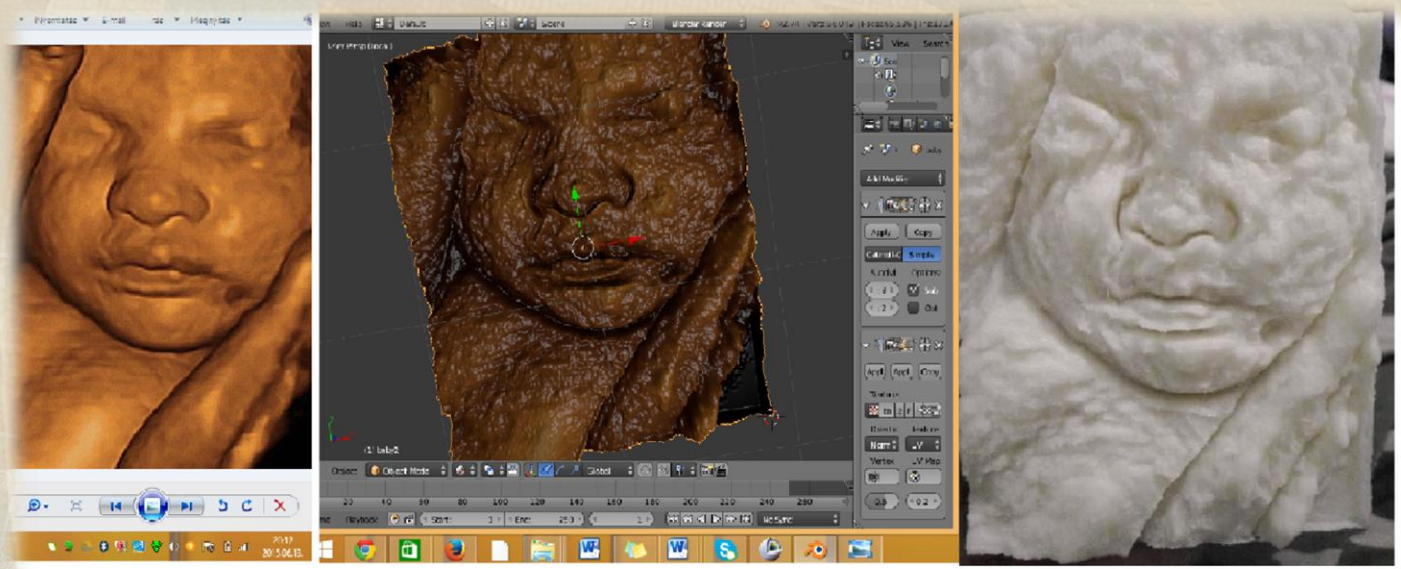
3D Printed Medicine

- US FDA recently gave approval for 3D printed pill to be produced
- Developed by Aprecia Pharmaceuticals and called Spritam (Wakefield)
- Drug controls seizures from epilepsy
- 3D printing allows
  - medicine to be packaged more tightly in precise doses



3D visualization, 3D planning

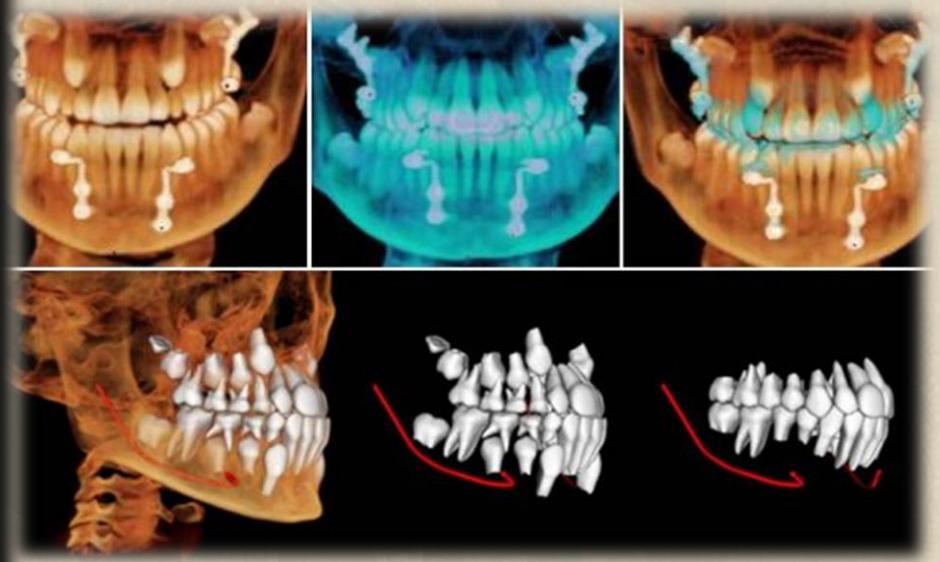
- 3D scanners
- CAD (computer associated design) programmes



Medical applications

- Dentistry
- Orthopedic implants
- Surgical planning
- Exoskeletons
- Innovative fracture immobilization
- Bioprinting

Dentistry

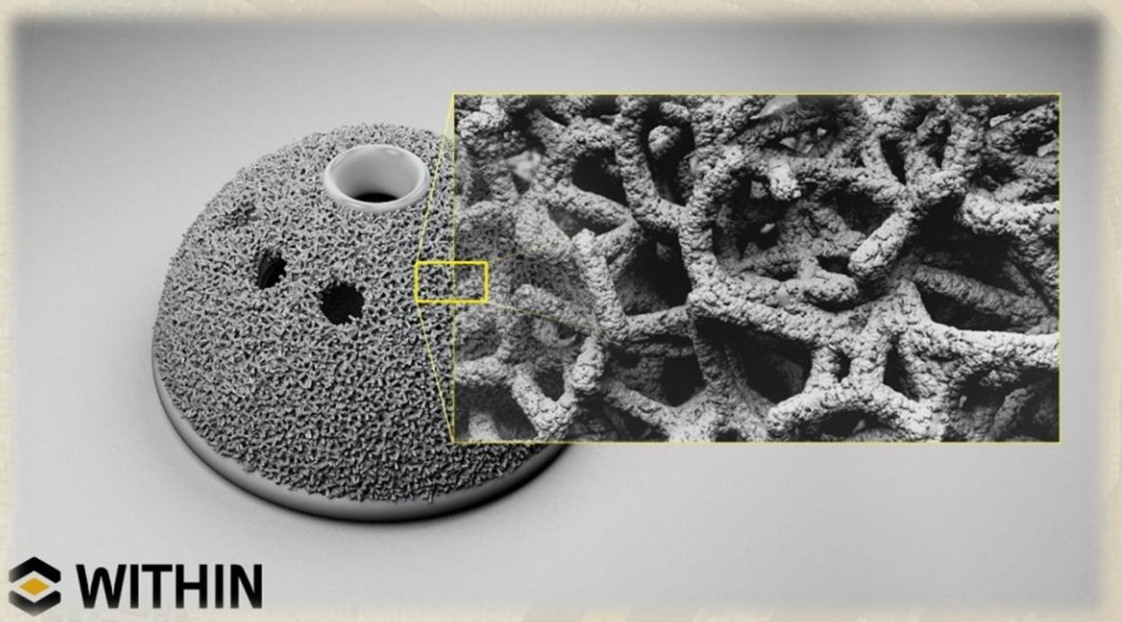


Surgical planning

- Heart- and vascular surgery
- Surgical simulation
- Preoperative, postoperative examinations
- Face surgery

Orthopedics

- Spine surgery
- Skull surgery
- Endoprothesis



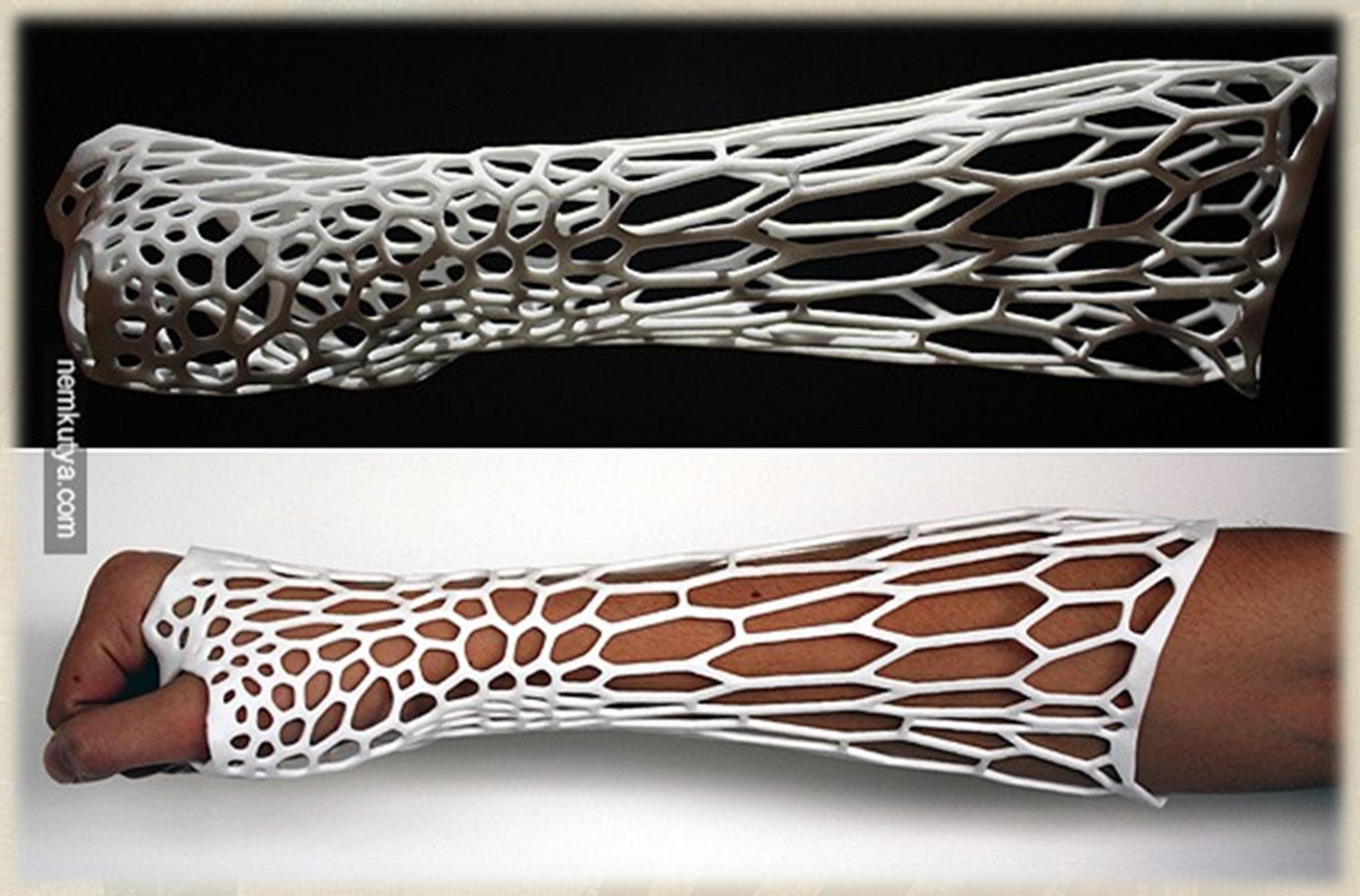
Prostetics and exoskeletons

- 2013 – The first licenced exoskeleton
- Test in 130 hospitals
- Fukushima

Prostetics and exoskeletons

E-Nable

Innovative fracture immobilization



Bioprinting

- Organ, tissue printing
- Stem cells are grown in bioreactors
- Tissue differentiation - bioink

Thank you for your attention!